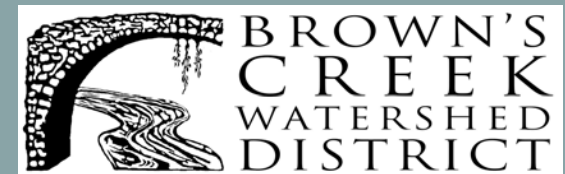


Open Yard Series: All Things Raingardens!



Lauren Haydon – Water Resources Educator
Brett Stolpestad – Natural Resource Design Technician

Moderator: Cameron Blake, BCWD

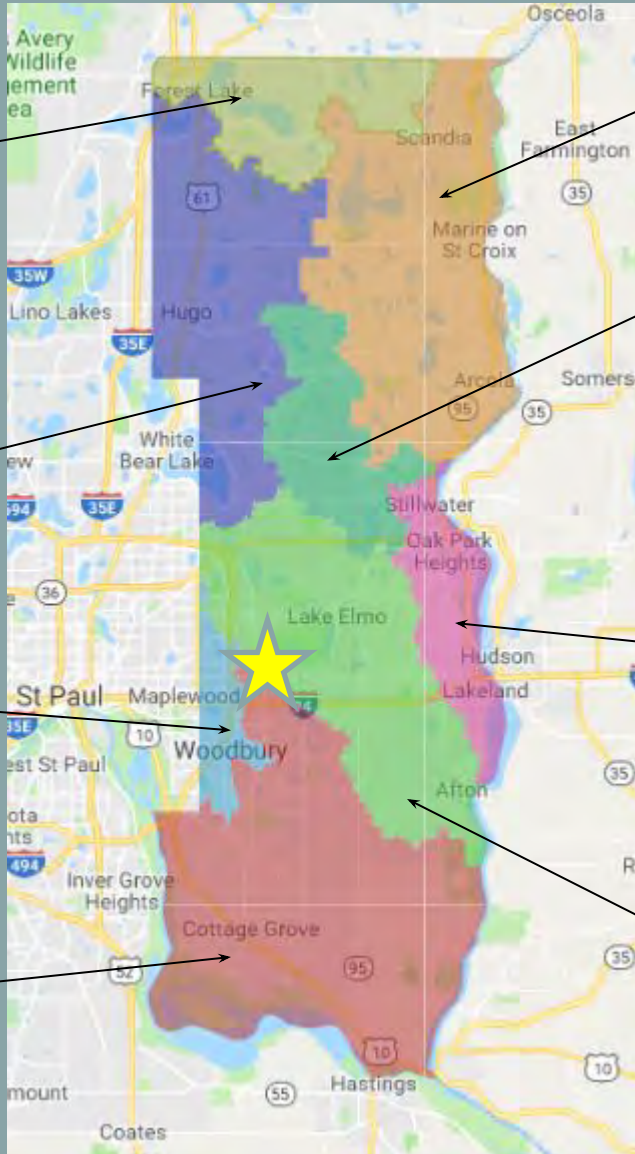


Mission Statement

To enhance, protect, and preserve the natural resources of Washington County through conservation projects, technical guidance, and educational services to citizens and local government.
Est. 1942



Watershed Management Organizations Washington County

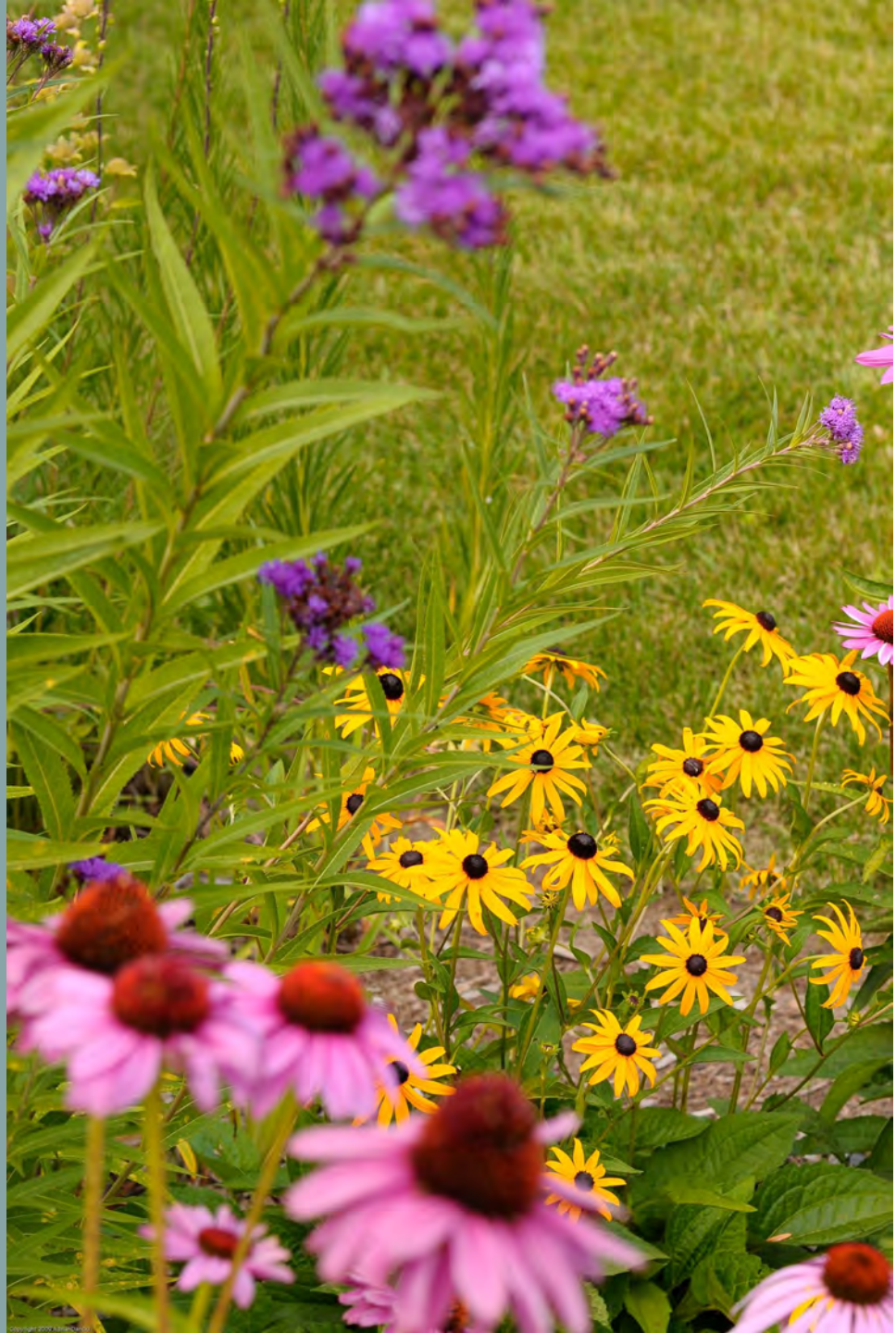




Workshop Agenda:

1. Raingarden Overview
2. Planning & Layout
3. Plant Selection
4. Installation
5. Maintenance
6. Technical Assistance & Cost Share Grants

Section 1: Raingarden Overview



Why Raingardens?

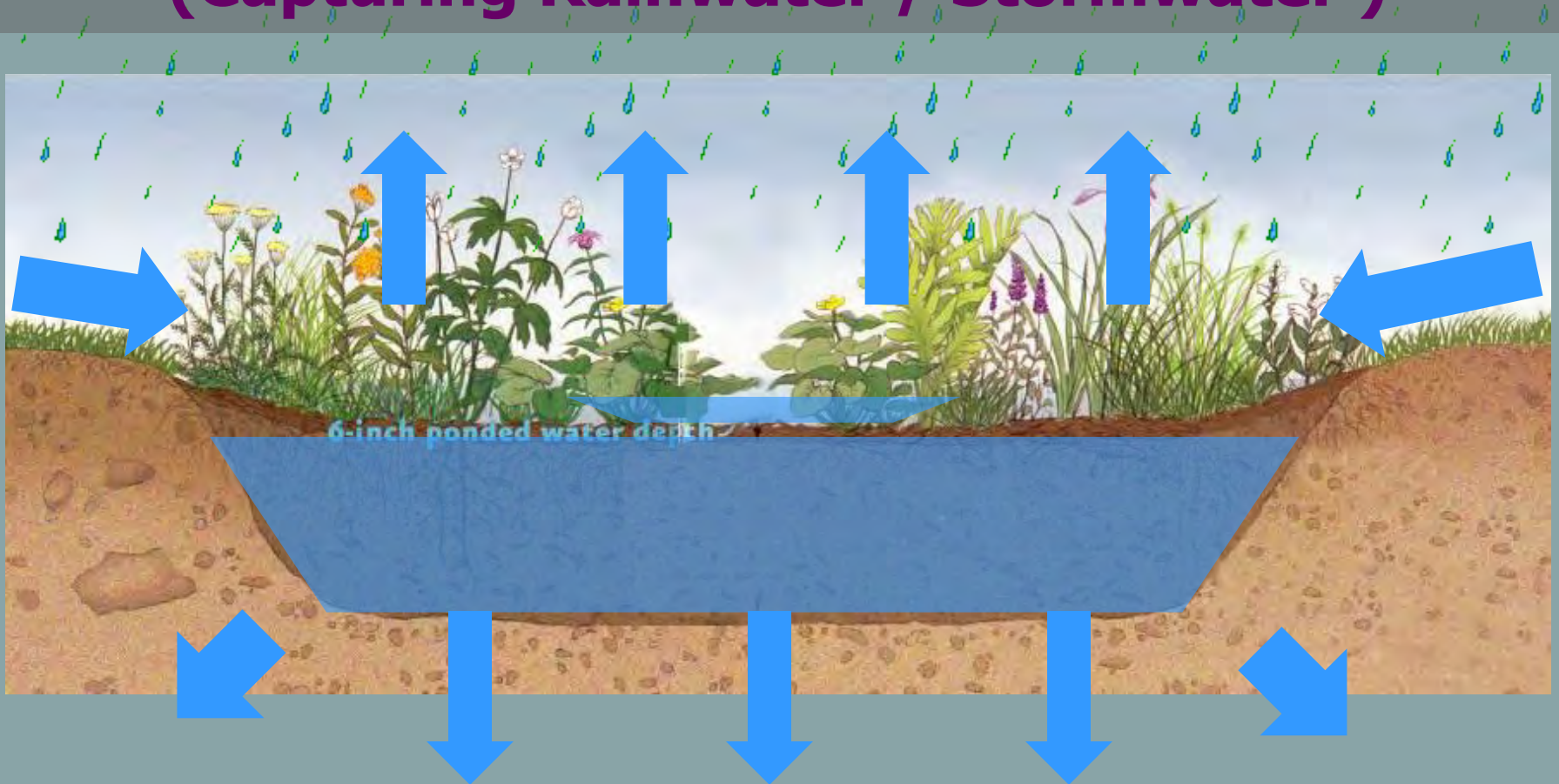


- Reduce pollution to lakes, rivers and streams
- Beautify your landscape
- Attract birds and butterflies



Raingarden in Mahtomedi

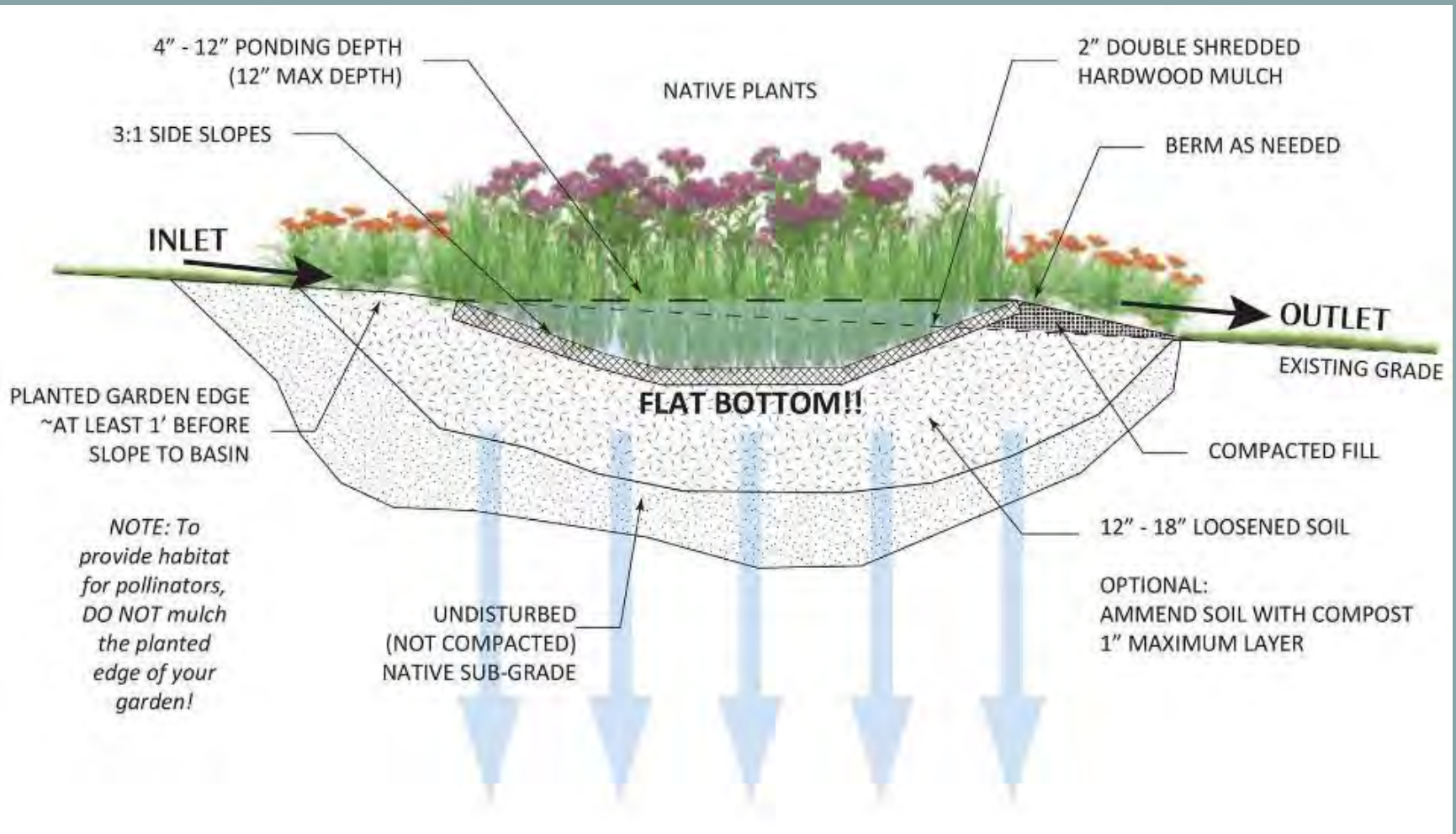
Raingardens (Capturing Rainwater / Stormwater)



Just like a regular planting, but able to absorb rainwater and breakdown pollutants

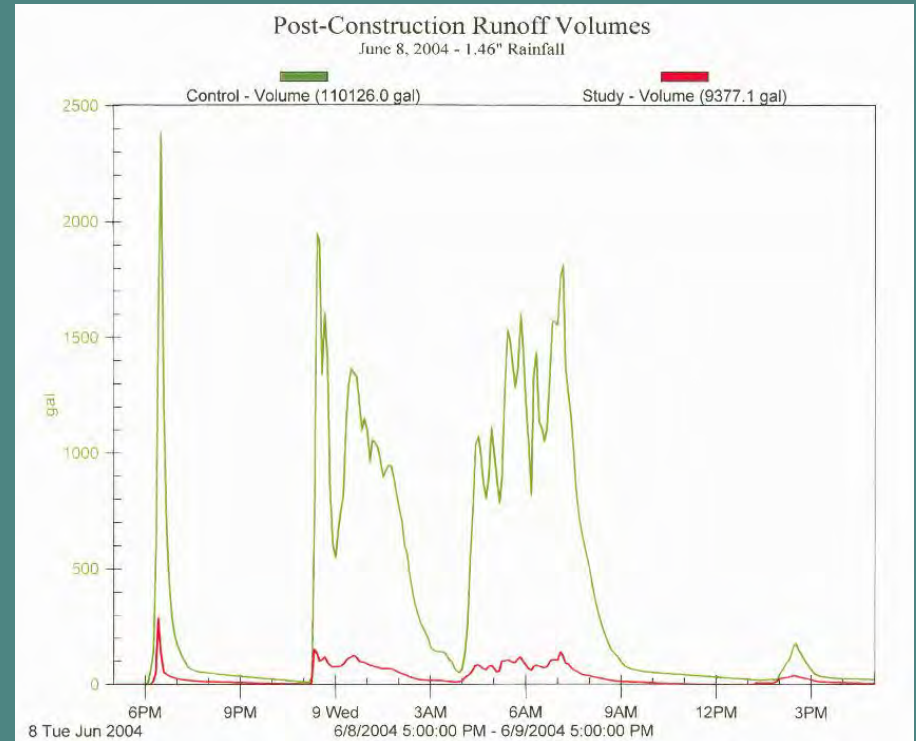
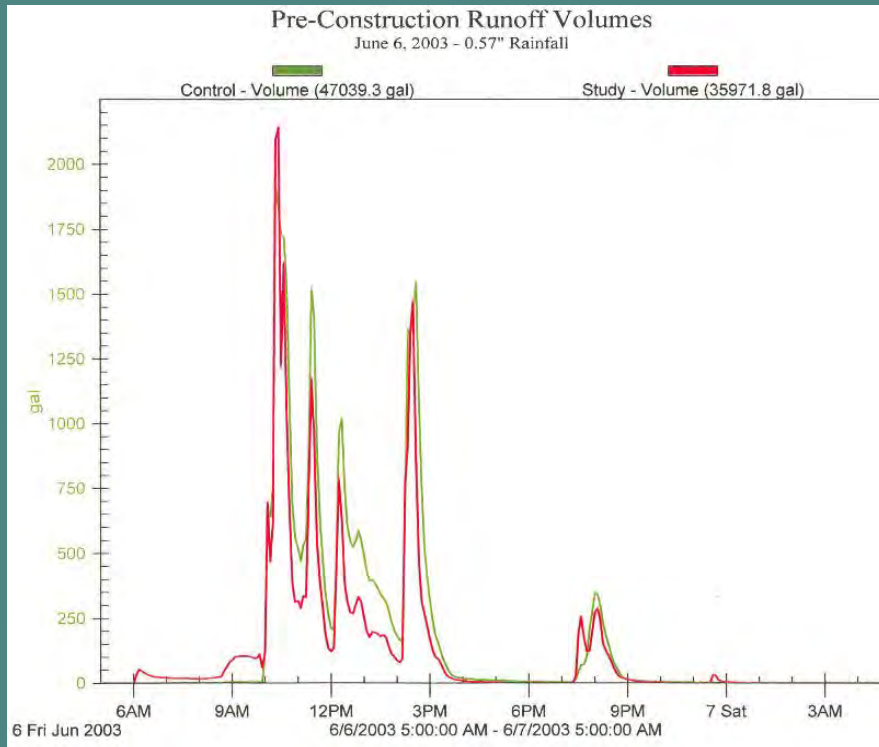
What defines a raingarden?

Lowered perennial plantings built to capture and infiltrate rainwater while breaking down pollutants and providing habitat.



85% Volume Reduction!!

Burnsville Rain Gardens - Monitoring Results



Often given the nickname, the "Muddy Mississippi", the Mississippi River enters into the Twin cities clean and clear. In just a short 32 miles, from the confluence of the Mississippi River and Minnesota River (above photo) to the confluence of the Mississippi River and the St. Croix River (below photo), the Mississippi has become true to it's name: Muddy! What do you think contributed to this change in water quality?

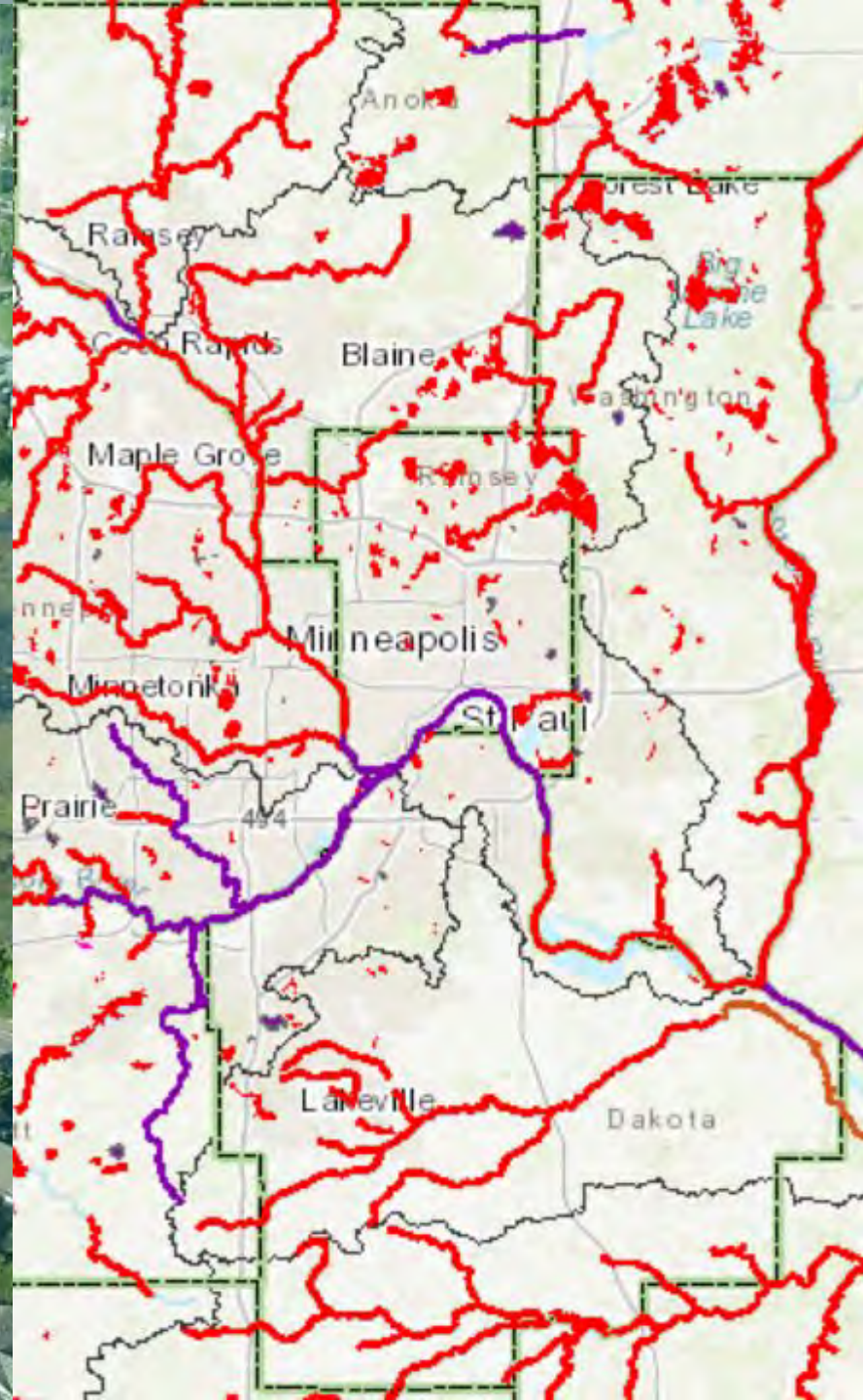




Gulf of
Mexico

copyright GEOSPACE

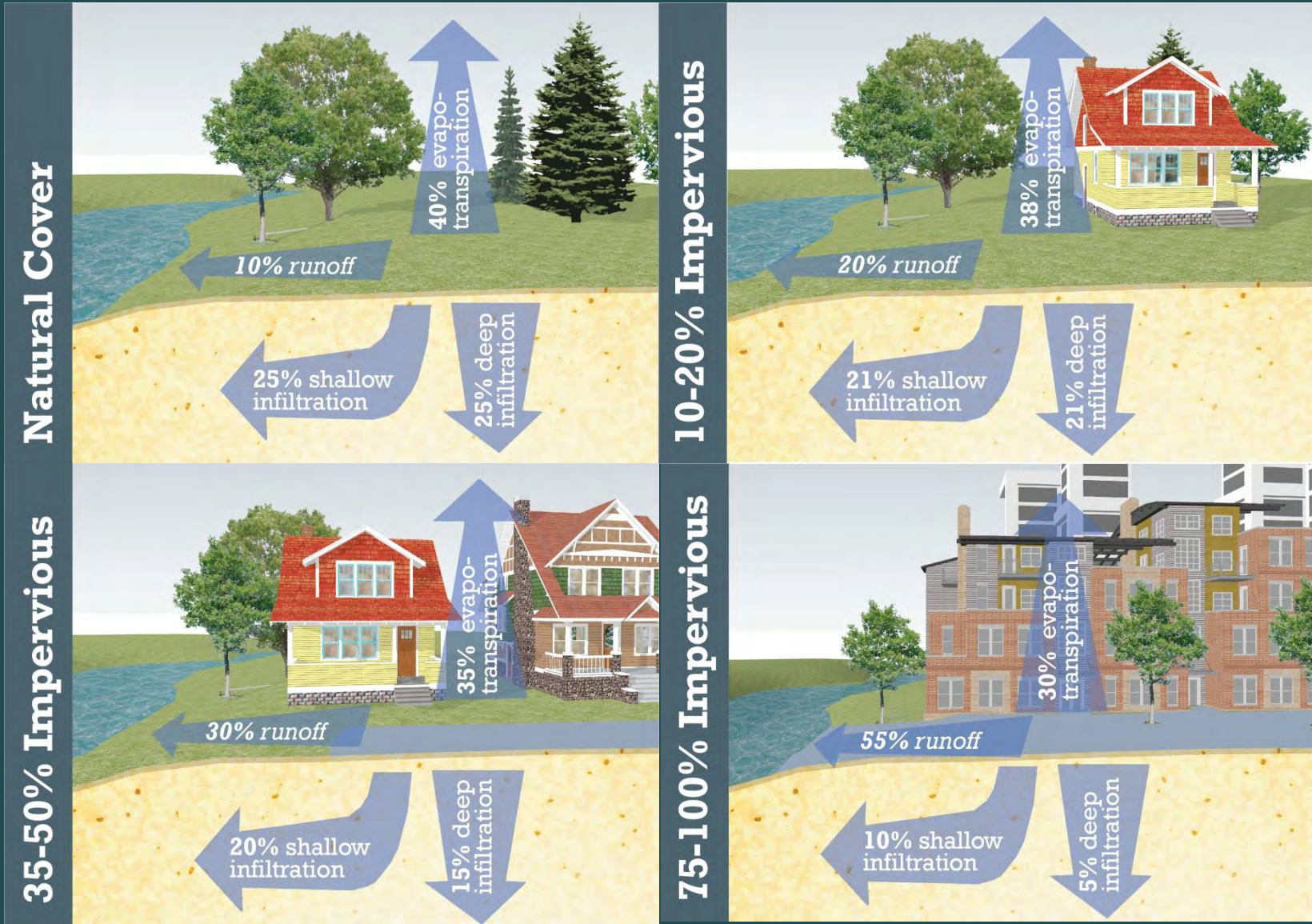
40% of MN lakes, rivers & streams are impaired





One pound of phosphorus =
500 pounds of algae

Impacts of changes in land cover

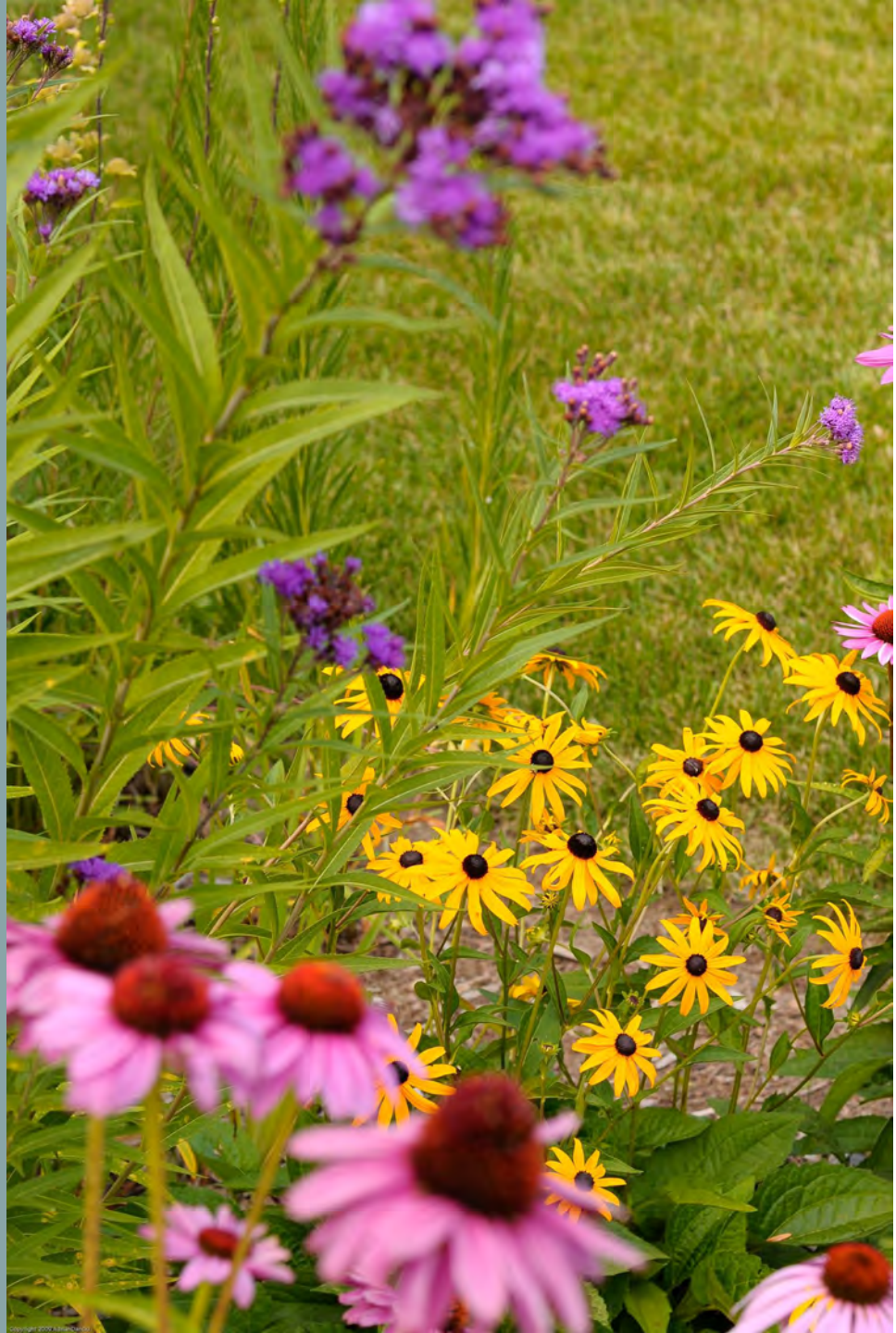


How can YOU make a difference?



Section 2:

Planning & Layout



Places to Avoid Building a Raingarden

- Next to trees/beneath trees
- On top of utilities/septic fields/wells
- Within 10 ft of your house if you have a basement
- Over areas of shallow bedrock or shallow groundwater (areas that frequently flood)



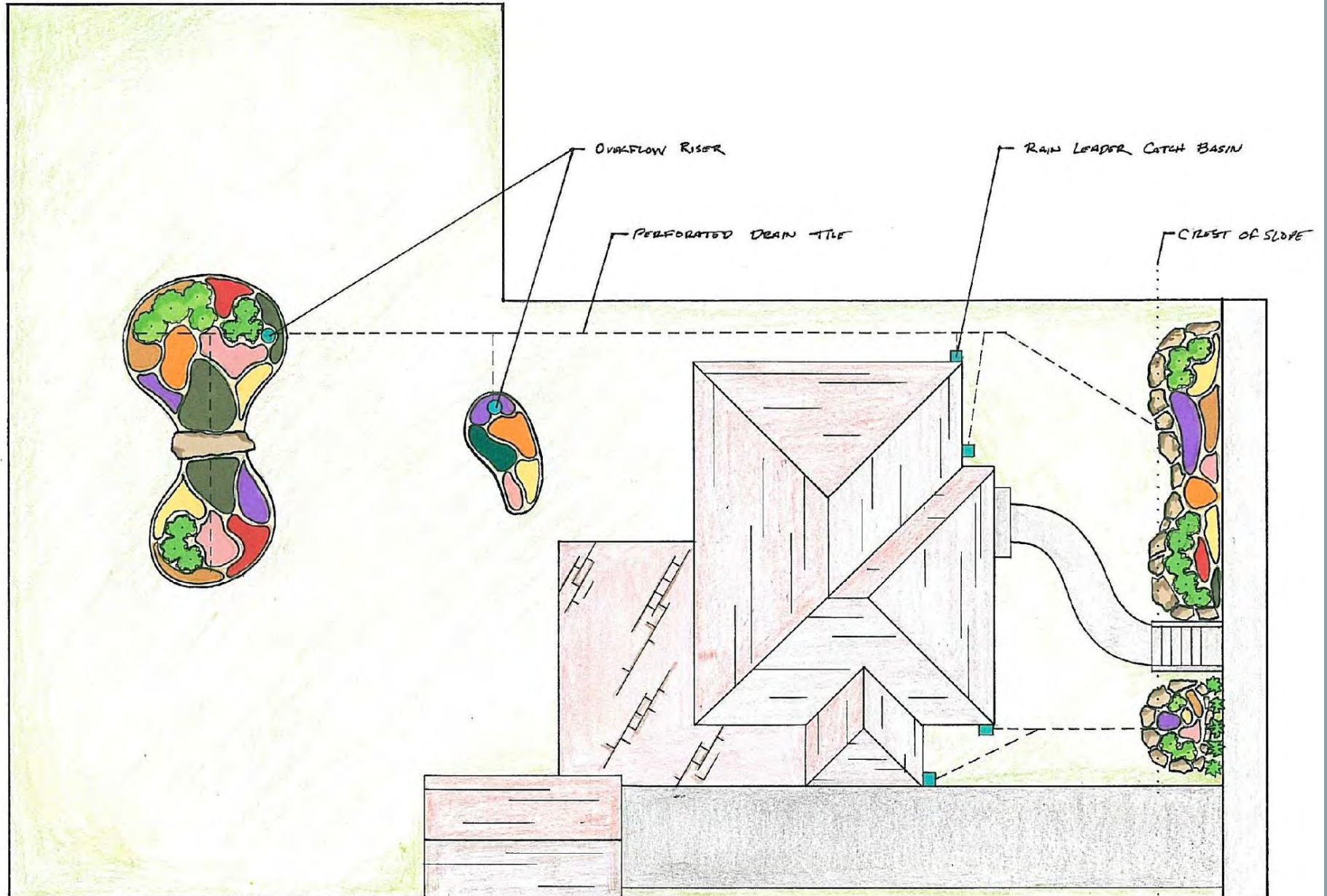
**Know what's below.
Call before you dig.**

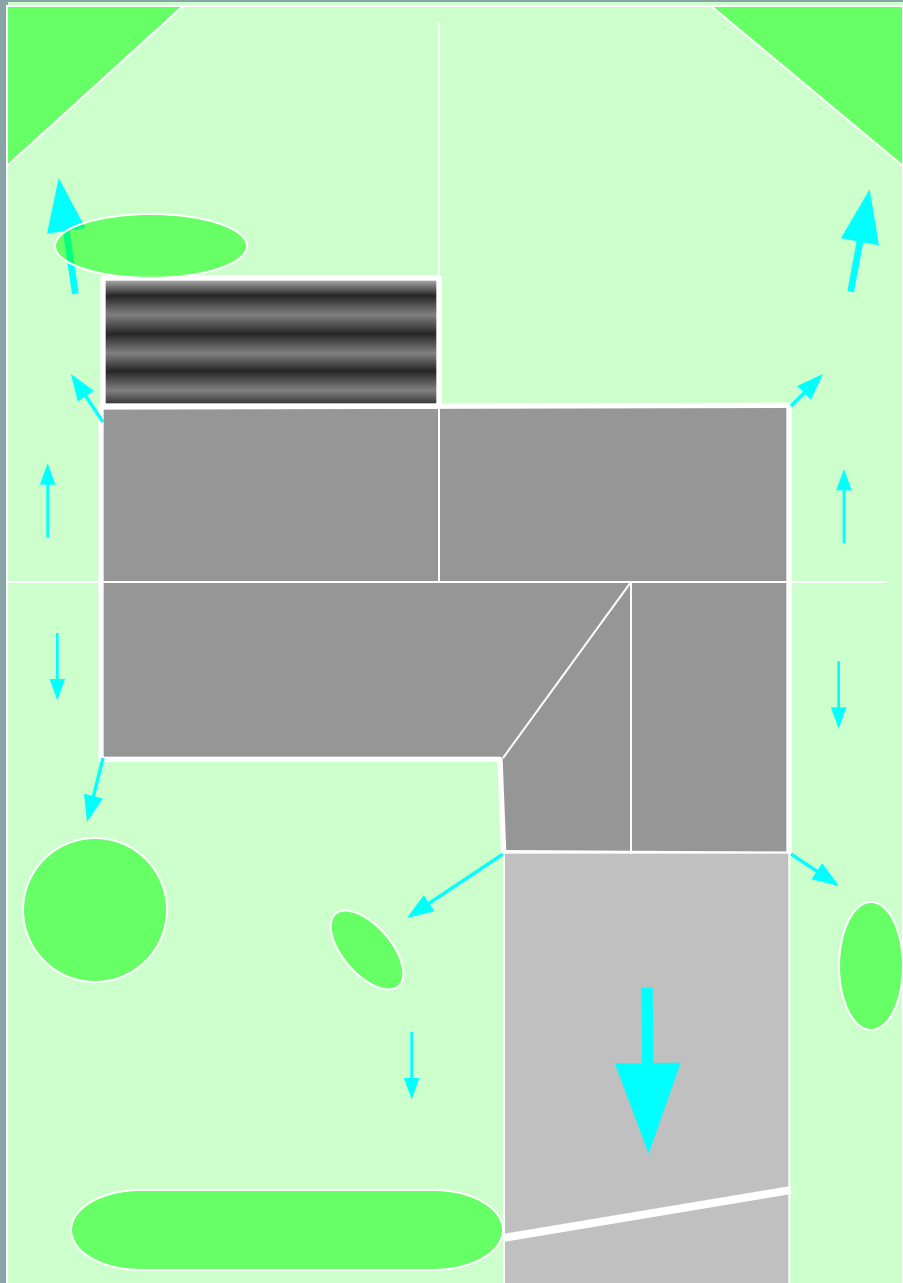
Where would you put a raingarden?



Driveway Diversion

Project planning & Garden design



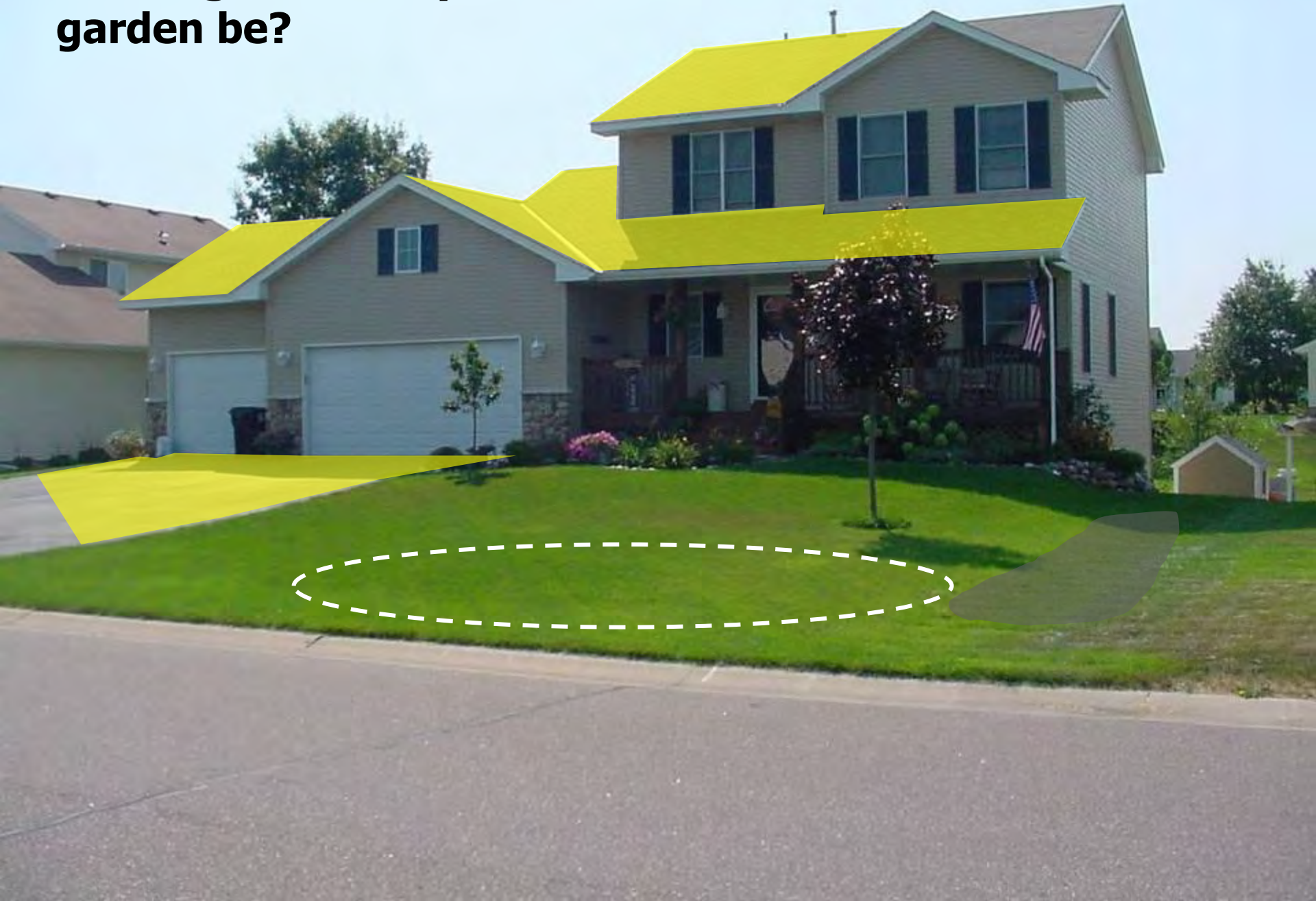


**LOCATIONS for
RAINGARDENS:**

Stormdrain

Street

How big should my rain garden be?



Sizing Shortcut



1. Assume a rain event of about 1"
2. Estimate the surface area of your roof, driveway, and/or other impervious surfaces to be routed to your rain garden.
3. Do a percolation test to observe how much water soaks into your soil over a 24-hour period.
4. Divide the square footage of your drainage area by the depth of your rain garden (determined by the percolation test)
5. The result is the approximate area (in square feet) needed to capture the average runoff volume during a 1" rain event.

Infiltration test Test

1. Dig a hole roughly 8" x 8" (coffee can size)
2. Fill with water and mark the starting water level
3. Measure how far the water level drops over a set time interval (30 minutes, 1 hour, 2 hours, etc.)
4. Take your rate of fall (ex. 1 inch of drop over 4 hours) and multiply by 24 to get total amount of infiltration over a 24 hour period.

$$\frac{1 \text{ inch}}{4 \text{ hrs}} \times \frac{24 \text{ hrs}}{\text{day}} = 6 \text{ inches/day}$$

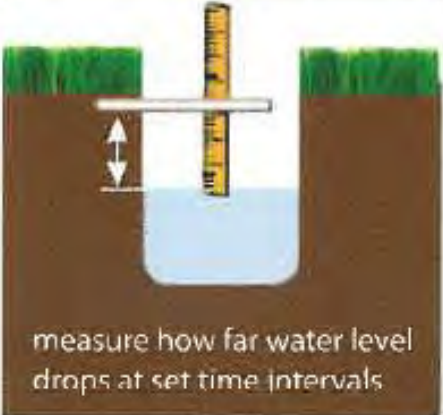
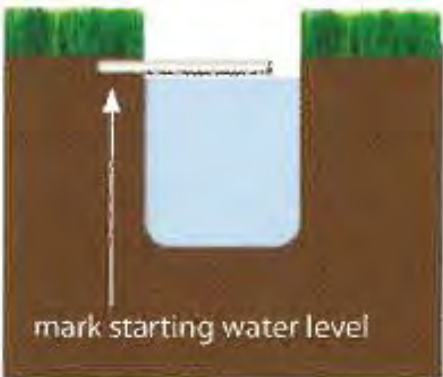
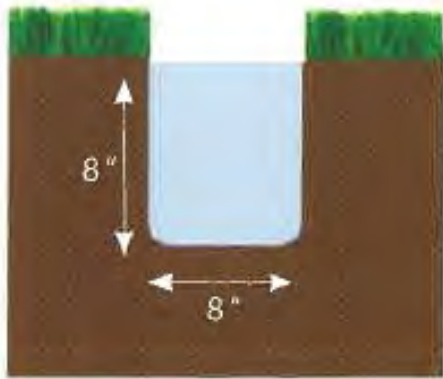
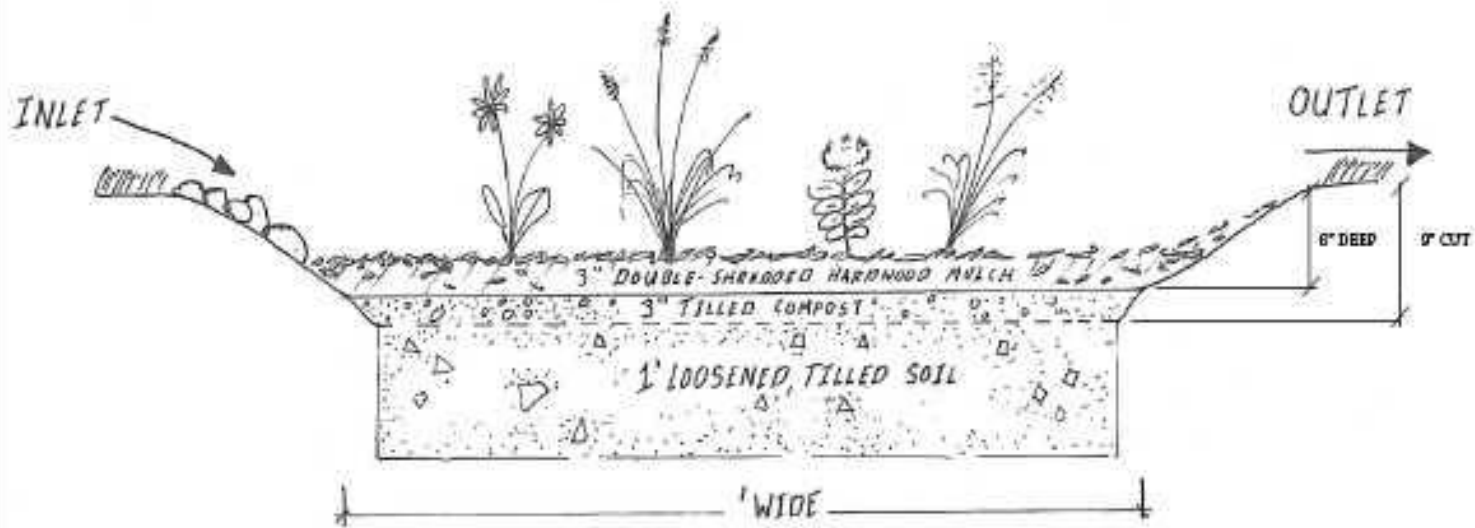


ILLUSTRATION BY MAX/DRIE VICOREN & CITY OF PLYMOUTH, MN

Example in section

EXAMPLE RAIN GARDEN



NOTES: ROCK MAY BE NEEDED AT INLET IF HIGH FLOWS WILL ENTER THE GARDEN



Copyright 2009 Adiantum

Photo credit: Blue Thumb Program



Photo credit: Blue Thumb Program



Designed by WCD

Before:



After:





Raingarden with downspout connection



Dry creek

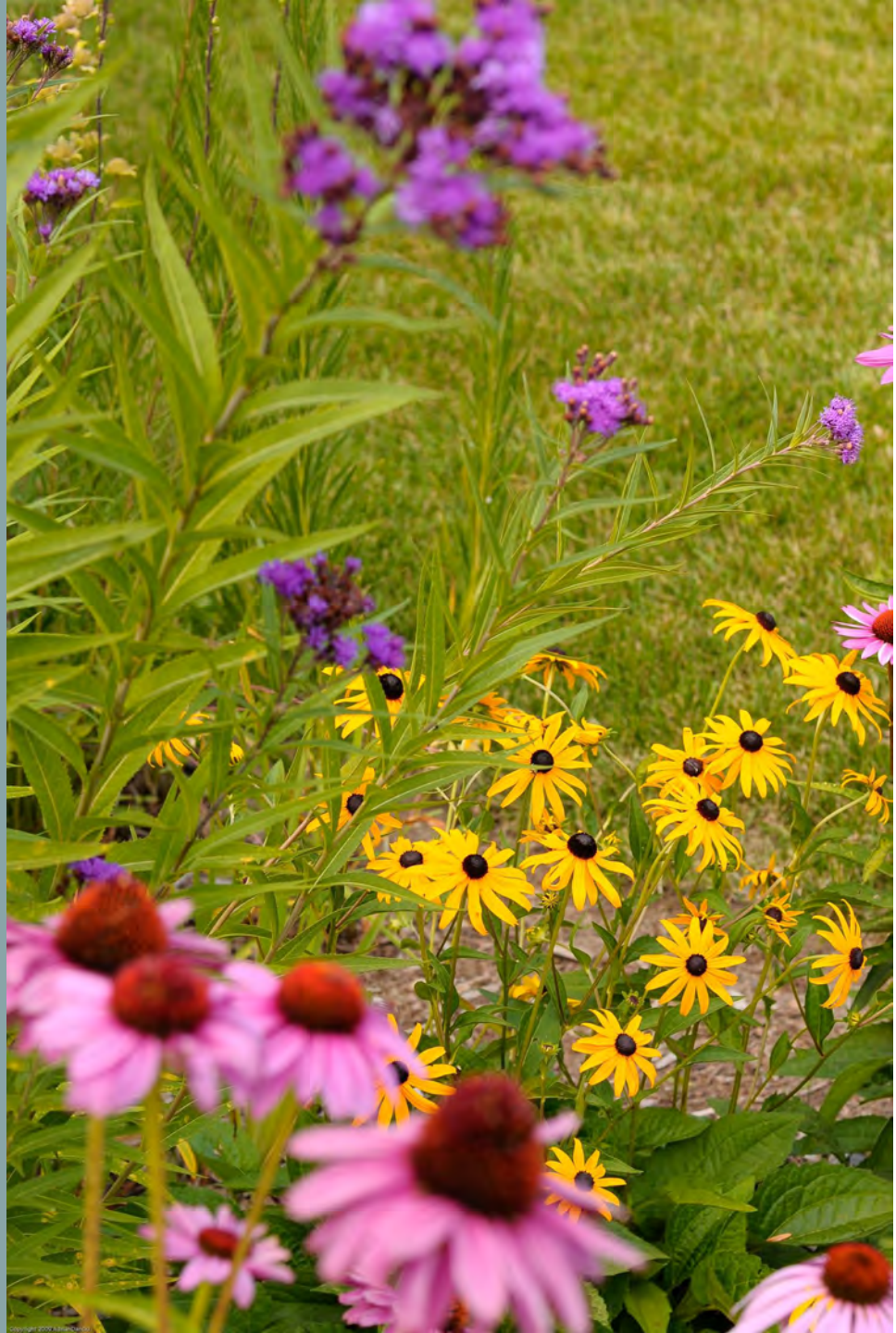


Dry creek

Brown's Creek Watershed District

Section 3:

Plant Selection



Pre-settlement Native Plant Communities



Big Woods



Oak Openings & Barrens

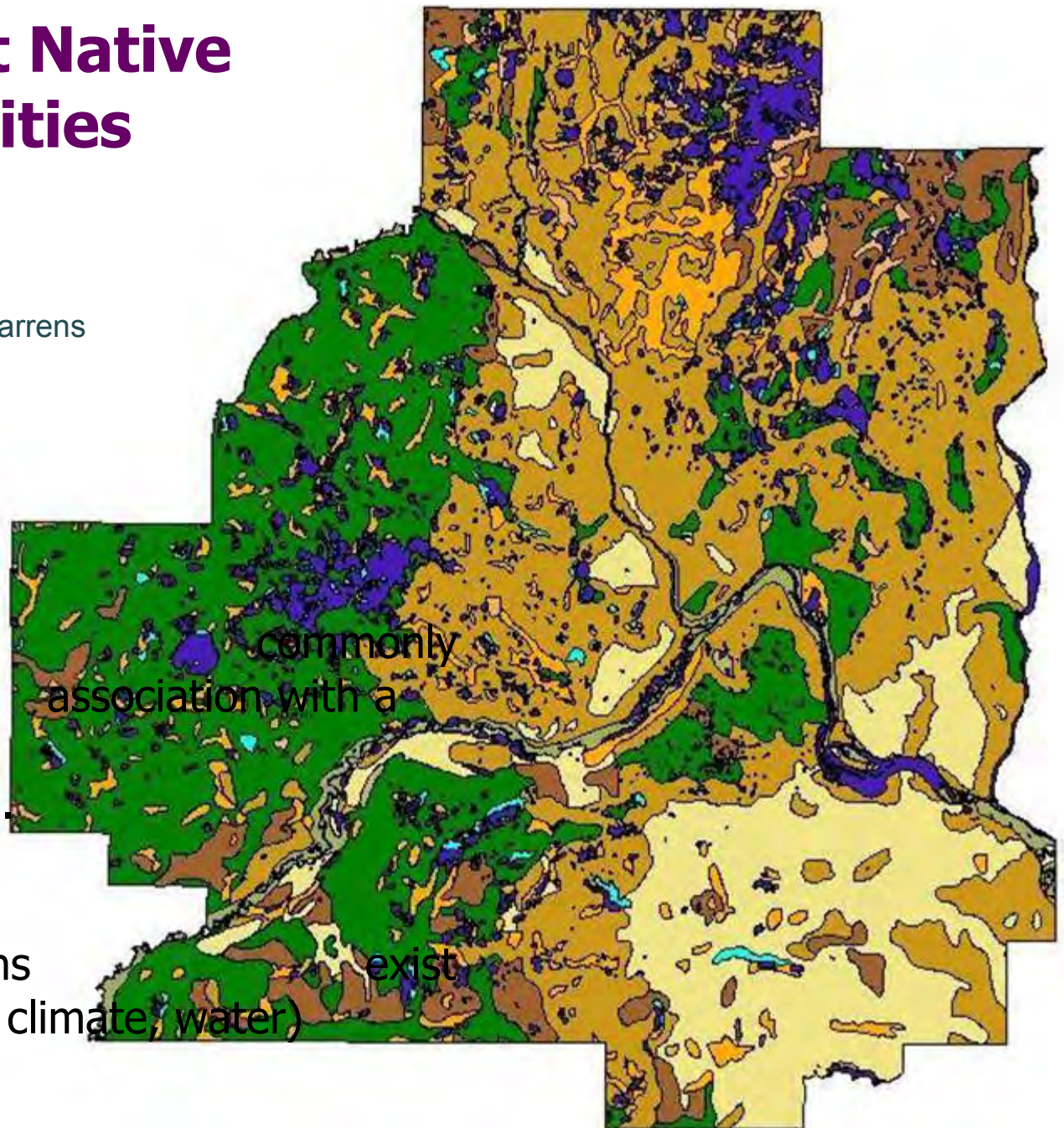


Prairie



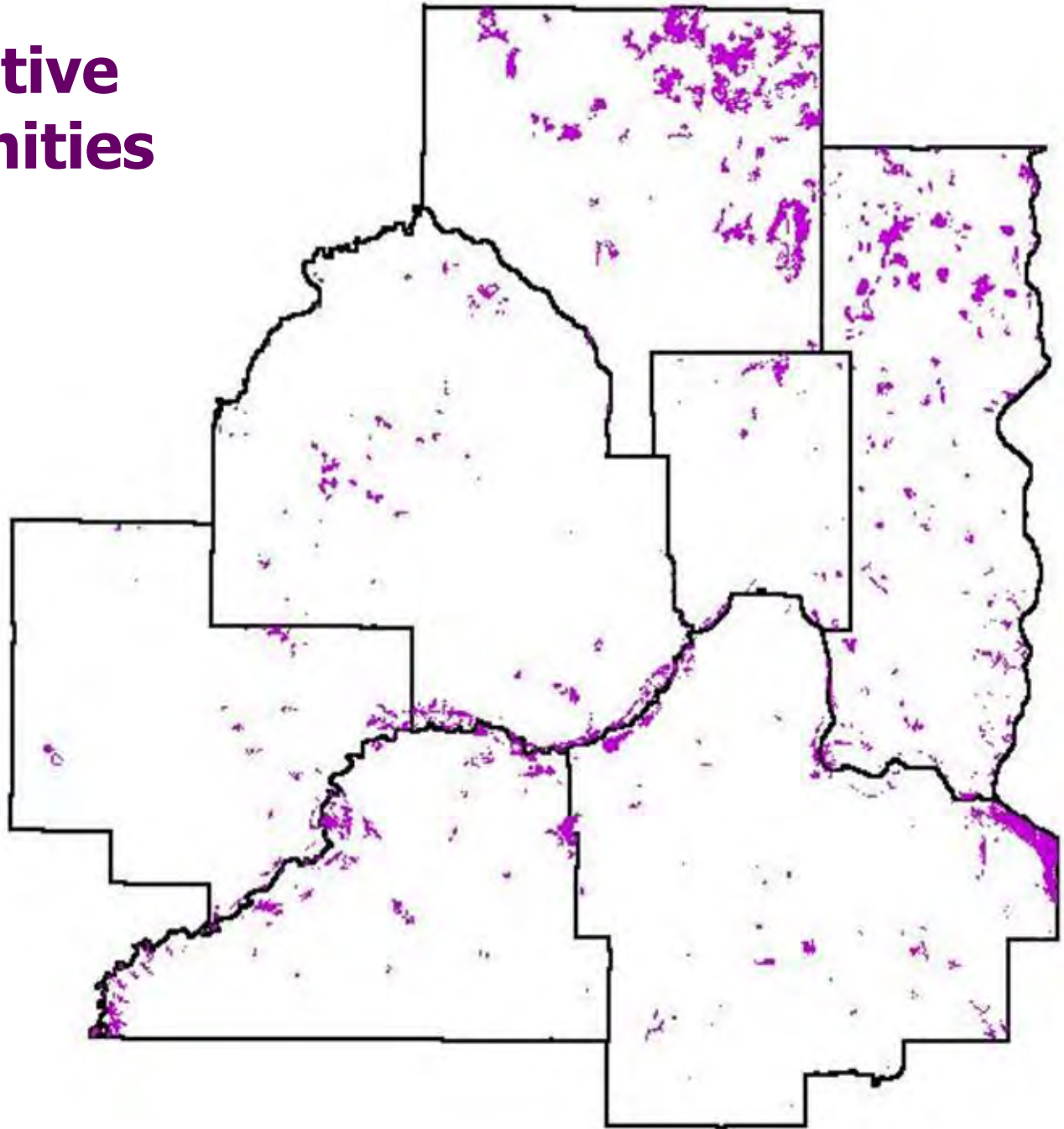
Wet Meadow

In nature, plants grow in particular group of other compatible plants. These communities are found where specific environmental conditions (e.g. soils, topography, climate, water)



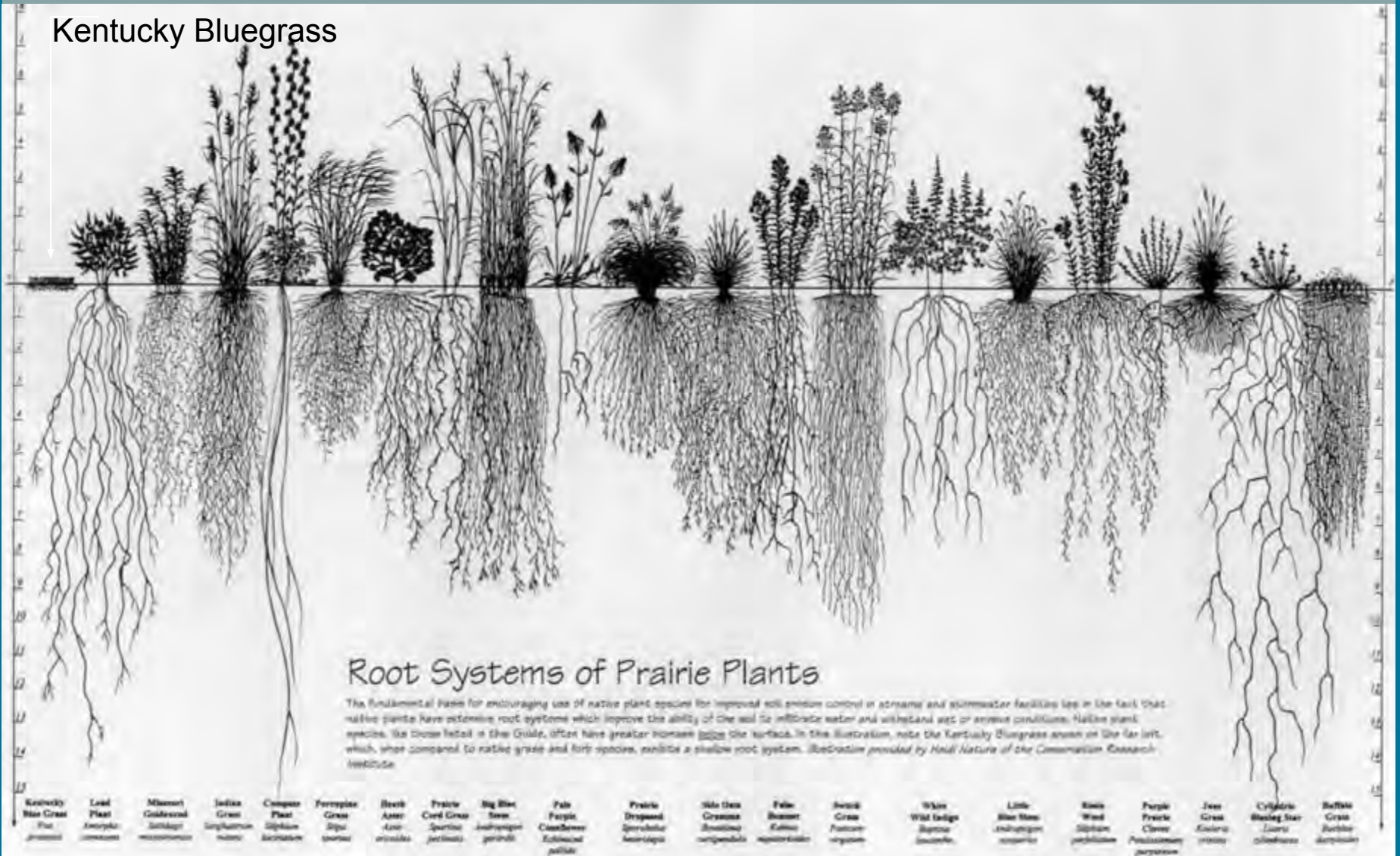
Remaining Native Plant Communities

Vegetation removal and soil disturbance (and soil compaction) reduces the amount of runoff absorbed, increasing sediment-laden runoff into lakes, streams & wetlands.



Roots of Native Prairie Plants

Kentucky Bluegrass





Cardinal Flower

Yellow coneflower

Purple coneflower

Aster species

DODS

David Dods, URS



Common Milkweed

Asclepias syriaca



Whorled Milkweed

Asclepias verticillata



Marsh milkweed

Asclepias incarnata



Butterfly Milkweed

Asclepias tuberosa

Shady to Partial Shade



Culver's Root

Wild Geranium



Columbine



Lady Fern



Fox Sedge

Partial Sun to Partial Shade



Culver's Root



Blue Lobelia



Turtlehead



Sprengel's Sedge



Bottle Gentian

Full Sun



Prairie
Dropseed



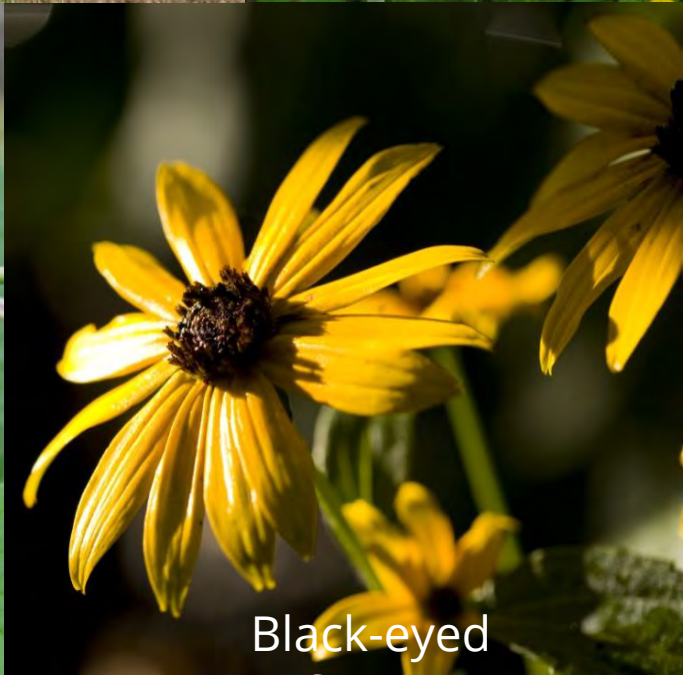
Lance leaf Coreopsis



Pale Purple
Coneflower



Anise Hyssop



Black-eyed



Butterfly Milkweed

Full Sun



Prairie Blazing Star



Azure Aster



Little Bluestem



Meadow Blazing Star



Side Oats



Early Sunflower

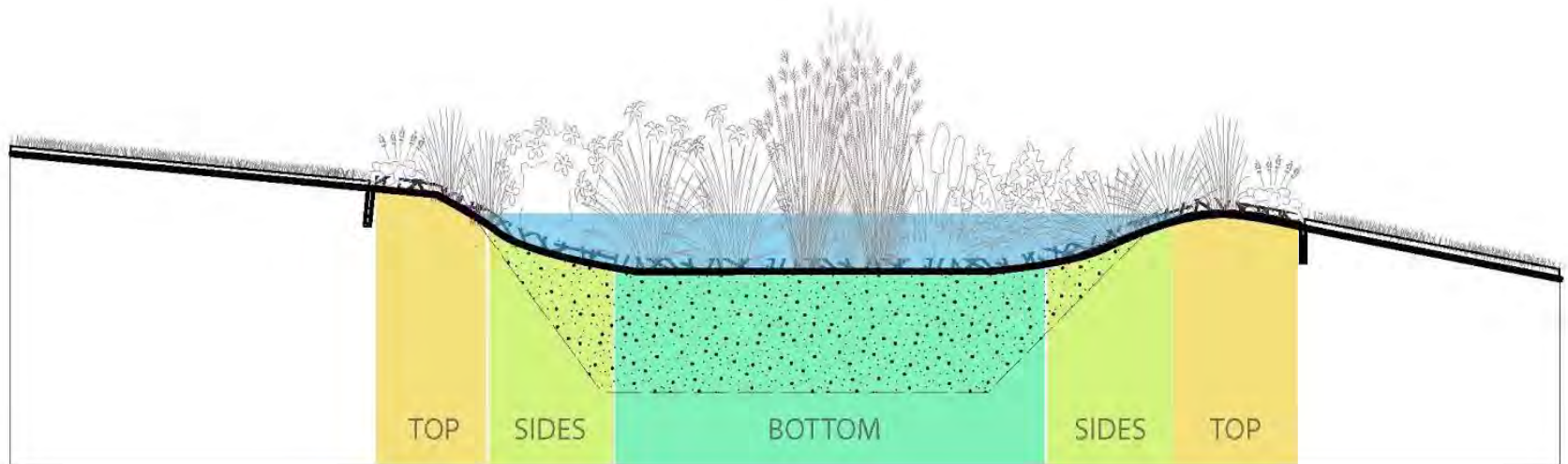
Incorporate native plants



Pick the best plant for the location

Raingarden Planting Zones

Cross-section





Minnesota Wildflowers

a field guide to the flora of Minnesota

Plant name: Search

or try: [advanced plant search](#)

goal \$12000
\$13849 donated [Donate](#)

Share: [f](#) [t](#) [e](#)

- Home
- What's Blooming
- Plants by Name
- Flowers by Color
- Trees
- Shrubs
- Vines
- Ferns and Fern Allies
- Grasses, Sedges, Rushes
- Aquatics
- Rare Plants
- Invasive Species
- Glossary
- Links
- About Us
- Contact
- [Help Support This Site](#)
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- [Donate](#)
- VISA
- Follow Minnesota Wildflowers
- [Find us on Facebook](#)
-

Osmundastrum cinnamomeum (Cinnamon Fern)

Contributed by Cindy Hoffmann

Pick an image for a larger view. See the [glossary](#) for icon descriptions.

Detailed Information

Fiddlehead:



As the fern emerges from the ground in early spring it is covered in a light brownish-colored wool but it is quickly lost.

Leaves and stems:



Leaves are once compound, generally lance-shaped in outline, up to 40 inches long and 10 inches across, widest below the middle and gradually tapering at the tip end. Leaflets have deep lobes, rounded to slightly pointed, and forked lateral veins on the underside. The

leaves are nearly erect to arching and grow in a circular clump with the fertile spike (if present) growing in the middle.



There is a persistent tuft of whitish to brownish hair on the underside of the leaf at the junction of the main stem and leaflet mid-nerve. Stem is green and slightly grooved on the upper side.

Spores:



In mid to late spring, 1 or more spike-like fertile leaves, nearly as tall as the sterile leaves, grow in the center of the leaf clump. Fertile leaves are hairy and composed of very small bead-like capsules (which contain the spores) that are initially green but turn cinnamon-colored with maturity. After releasing the spores, the fertile leaf dies and is inconspicuous.

Notes:

Since the leaves, size and overall structure of Cinnamon Fern, [Ostrich Fern](#) (*Matteuccia struthiopteris*) and [Interrupted Fern](#) (*Osmunda claytoniana*) closely resemble each other, they can be distinguished by the fruiting fertile fronds. If spores are not present, the easiest way to distinguish the 3 species is to turn over the leaf and see if there is a tuft of hair at the junction of the main stem and leaflet - only Cinnamon Fern has this feature. Cinnamon Fern was formerly known as *Osmunda cinnamomea* but was recently moved to genus *Osmundastrum*, presumably because genetic testing found it not as closely related to Interrupted Fern as previously thought. While in some areas of the country Cinnamon Fern may reach heights of 5 feet, it doesn't get quite that tall in Minnesota.

Plant Info

| | |
|------------------------------------------------|-----------------------------------------------------|
| Also known as: | |
| Genus: | Osmundastrum |
| Family: | Osmundaceae (Royal Fern) |
| Life cycle: | perennial |
| Origin: | native |
| Habitat: | part shade, shade; marshes, wet woods, bogs, swamps |
| Fruiting season: | spring |
| Plant height: | 24 to 40 inches |
| Wetland Indicator Status: | GP: FACW MW: FACW NCNE: FACW |
| MN county distribution (click map to enlarge): | |
| National distribution (click map to enlarge): | |

Helpful Resources

Minnesota Wildflowers
<https://www.minnesotawildflowers.info/>

- Habitat ✓
- Size ✓
- Range map ✓
- Detailed descriptions and photos ✓
- Bloom time ✓
- Plants searchable by dozens of criteria (bloom time, flower color and shape, taxonomy, etc.) ✓

Helpful Resources

Prairie Moon Nursery

<https://www.prairiemoon.com/>

- Size ✓
- Sun ✓
- Moisture ✓✓
- Height ✓✓
- Bloom time ✓
- Spacing ✓✓
- Advantages (wildlife benefit, garden suitability, aggressiveness, etc.) ✓



Liatris punctata
DOTTED BLAZING STAR

SEEDS

Packet \$2.50 - 0 +
1/8 oz. \$7.50 - 0 +

ADD TO CART

WISHLIST

← PREVIOUS PRODUCT

NEXT PRODUCT →

[ABOUT](#) [RANGE MAP](#) [Q&A](#) [PLANTING](#) [SHIPPING](#)

A deep root system will form on this xeric, long-lived *Liatris*, protecting it well in hot, dry climates as indicated by the range map.

DETAILS

| | |
|------------------|-------------------------|
| Seeds/Package | 70 |
| Seeds/Ounce | 7,000 |
| Germination Code | C(30) |
| Life Cycle | Perennial |
| Sun Exposure | Full, Partial |
| Soil Moisture | Medium-Dry, Dry |
| Height | 2 feet |
| Bloom Time | July, August, September |
| Bloom Color | Purple |
| Advantages | |
| USDA Zones | 3-9 |
| Plant Spacing | 10-12" |
| Catalog Number | LIA08F |

Find Plants:

Search ...

All Light Exposure

All Soil Moisture

All Plant Types

All Bloom Colors

All Bloom Months

FIND PLANTS

Plant Finder

Plant information for the plant finder



Balsam Fir
Abies balsamea



Silver Maple
Acer saccharinum



Common Yarrow
Achillea millefolium



Sweet Flag
Acorus calamus



White Baneberry
Actea pachypoda



Maidenhair Fern
Adiantum pedatum

- Sun ✓
- Moisture ✓
- Type (forb, fern, grass, woody, vine) ✓
- Bloom time and color ✓

Helpful Resources

Blue Thumb Plant Finder

<https://bluethumb.org/plants/>



Wild Ones Reflections



Check out our new publication—
Read, Learn, Enjoy, Share!

Native Plant Nurseries & Landscaping Services



Link to list of nurseries in Minnesota with selection of native plants for gardens.

No Milkweed = No Monarchs



No Milkweed = No Monarchs

Membership

Joining Wild Ones gives you access to the camaraderie and information resources of other native plant enthusiasts. A single membership covers both the national organization and your local chapter. Members receive the Wild Ones [New Member Handbook](#) and the *Wild Ones Journal*, a bimonthly publication. In addition, the Twin Cities Chapter publishes a local newsletter.

Membership benefits include participation in any and all Wild Ones chapter activities, either locally or across the United States. These activities include such events as seed gathering, seed exchanges, plant rescues, plant sales, speaker presentations, garden tours, conferences, and bus tours.

You can join at any of our monthly meetings or by registering online on the Wild Ones National website, www.WildOnes.org

Wild Ones, Native Plants, Natural Landscapes is a non-profit, educational organization. Your membership is considered a donation and is entirely tax-deductible.

One of our member-only benefits is the Wild Ones Twin Cities Lending Library!

Come to a meeting to check out a book, and return it when you are done. Our current list is growing all the time, but includes classic titles like:



Audubon Guide to North American Wildflowers

Beautifully Sustainable - Freeing Yourself to Enjoy Your Landscape, by Douglas Owens-Pike

Bees - An Identification and Native Plant Forage Guide, by Heather Holm



Bringing Nature Home - How You Can Sustain Wildlife with Native Plants, by Douglas Tallamy

Butterflies and Moths - Field Guide

Fern Finder, by Anne C. & Barbara G. Hallowell

Helpful Resources

Wild Ones

<http://www.wildonestwincities.org/>

- Resources for gardening with natives plants ✓
- Plant sale info ✓
- Links to helpful books, videos, and materials ✓
- You can become a member!



Need plants?

Landscape Revival Native Plant Expo and Market

- Sept 12 | 9am-1pm – Shoreview
- Sept 19 | 9am-1pm – Oakdale City Hall

And many local native nurseries!

Visit your local Wild Ones chapter website for more information.

MINNESOTA & WESTERN WISCONSIN NATIVE PLANT NURSERIES



SYMBOLS d: Design Services i: Installation Services m: Maintenance Services

1 Blazing Star Gardens

Phone: 507-402-8337
Email: blazingstargardens@gmail.com
Web: www.blazingstargardens.com

d, l, m

2 Boreal Natives

3943 Munger Shaw Road, Cloquet, MN 55720
Phone: 218-729-7001
Email: borealnatives@prairieresto.com
Web: prairieresto.com/boreal_natives.shtml

d, l, m

3 Sogn Valley Farm

Phone: 763-614-8853
Email: dana@sognvalleyfarm.com
Web: www.sognvalleyfarm.com

Purchase at events & St. Paul Farmers' Market

4 Ecoscapes Sustainable Landscaping

Phone: 612-965-0848
Email: info@ecoscapes1.com
Web: www.ecoscapes1.com

d, l, m

5 Glacial Ridge Growers

Phone: 320-634-0136
Email: glaciridgegrowers@aol.com
Web: www.glacialridgegrowers.com
 St. Paul Farmers' Market on Saturdays

6 Shoreview Natives

1185 Shoreview Rd, Two Harbors, MN 55616
Phone: 218-341-5286
Email: shoreviewnatives@gmail.com
Web: www.shoreviewnatives.com

d, i

7 Landscape Alternatives

25316 St. Croix Trail, Shafer, MN 55074
Phone: 651-257-4460
Email: landscapealt@frontiernet.net
Web: www.landscapealternatives.com

8 MN Native Landscapes

8740 77th St NE, Otsego, MN 55362
Phone: 763-295-0010
Email: bre@mnlcorp.com
Web: www.mnnativelandscapes.com

d, l, m

9 Morning Sky Greenery

44804 East Highway 28, Morris, MN 56267
Phone: 320-795-6234
Email: info@morningskygreenery.com
Web: www.morningskygreenery.com

10 Natural Shore Technologies

1480 Cty Rd 90, Maple Plain, MN (new location)
Phone: 612-703-7581
Email: Rob.l@naturalshore.com
Web: www.naturalshore.com

d, i, m

11 Naturally Wild

Phone: 612-922-9279
Email: info@naturallywildflowers.com
Web: www.naturallywildflowers.com

Purchase at website-listed events.

12 Out Back Nursery

15280 110th St S, Hastings, MN 55033
Phone: 651-438-2771
Email: sales@outbacknursery.com
Web: www.outbacknursery.com

d, l, m

13 BluPrairie Native Plant Nursery

12975 32nd St, Watertown, MN 55388
Phone: 612-720-7941
Email: jdanie@bluprairie.com
Web: www.bluprairie.com

14 Prairie Moon Nursery

32115 Prairie Lane, Winona, MN 55987
Phone: 866-417-8156
Email: info@prairiemoon.com
Web: www.prairiemoon.com

Purchase online

15 Prairie Restorations Inc

31646 128th St NW, Princeton, MN 55371
 21120 Ozark Court North, Scandia, MN 55012
Phone: 800-837-5986
Email: info@prairieresto.com
Web: www.prairieresto.com

d, l, m

16 Native Sun Seeds and Plants

St. Croix Valley, MN
Phone: 651-318-8667
Email: nativesunseedsandplants@gmail.com
Web: www.nativesunseedsandplants.com

Purchase online or at website-listed events.

17 Shooting Star Native Seeds

20740 Cty Rd 33, Spring Grove, MN 55974
Phone: 888-983-3670
Email: info@ssns.com
Web: www.shootingstarnativeseed.com

18 Sunshine Gardens Nursery and Landscaping

1286 Shadywood Shores Dr NW
 Pine River, MN 56474
Phone: 218-947-3154
Email: sgardens@uslink.net
Web: www.sunshinegardens.tripod.com

d, l, m

19 Dragonfly Gardens

491 State Highway 46 Amery, WI
Phone: 715 268-7660
Email: info@dragonflygardens.net
Web: www.dragonflygardens.net

20 Lupine Gardens

880 155th St, Amery, WI 54001
Phone: 715-222-6669
Email: lupinegardens@yahoo.com
Web: www.lupinegardens.com

d, l

21 Kinnickinnic Natives

235 State Road 65, River Falls, WI 54022
Phone: 715 425 7605 or 715 222 6910
Email: whuhnke@dishup.us
Web: www.kinninatives.com

22 Leaning Pine Natives

3130 S Camp Amnicon Rd, South Range, WI
Phone: 715-398-5453
Email: phlina@gmail.com

Call for appointment.



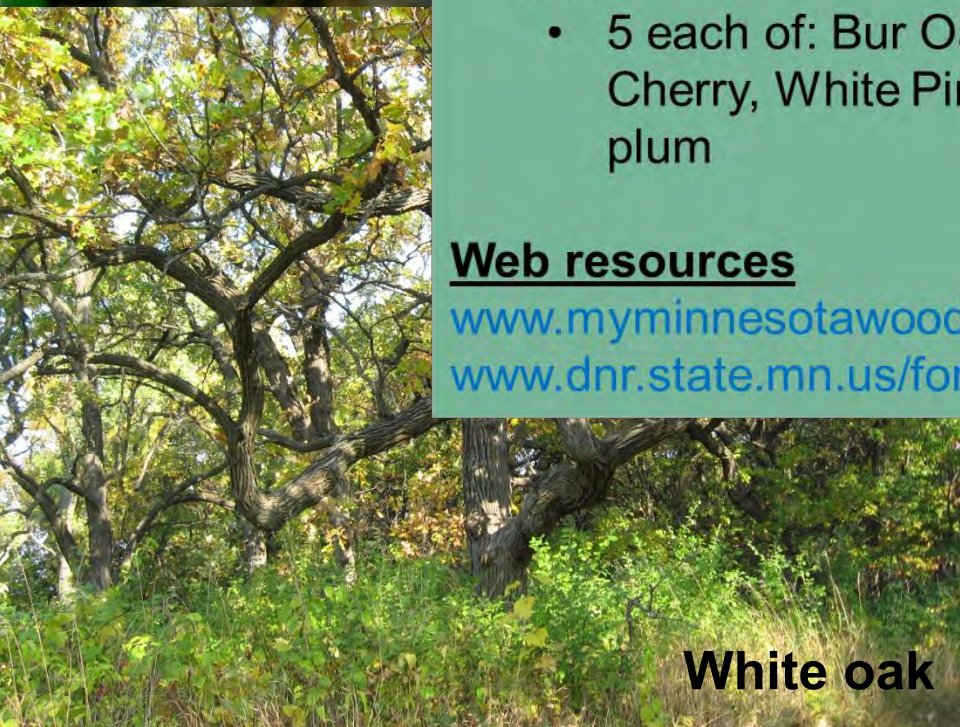
Washington Conservation District Tree Sale

- \$35.00 per bundle of 25 trees
- Bird packets are \$55.00 per bundle of 30 trees
 - 5 each of: Bur Oak, White Oak, Black Cherry, White Pine, Chokecherry, Wild plum

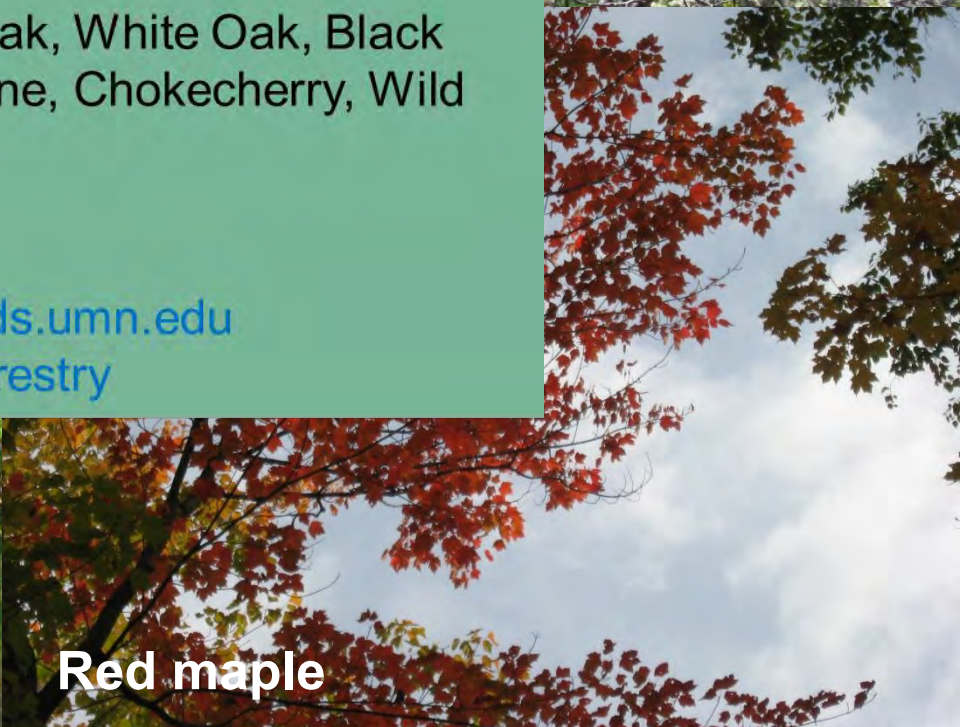
Web resources

www.myminnestawoods.umn.edu

www.dnr.state.mn.us/forestry



White oak



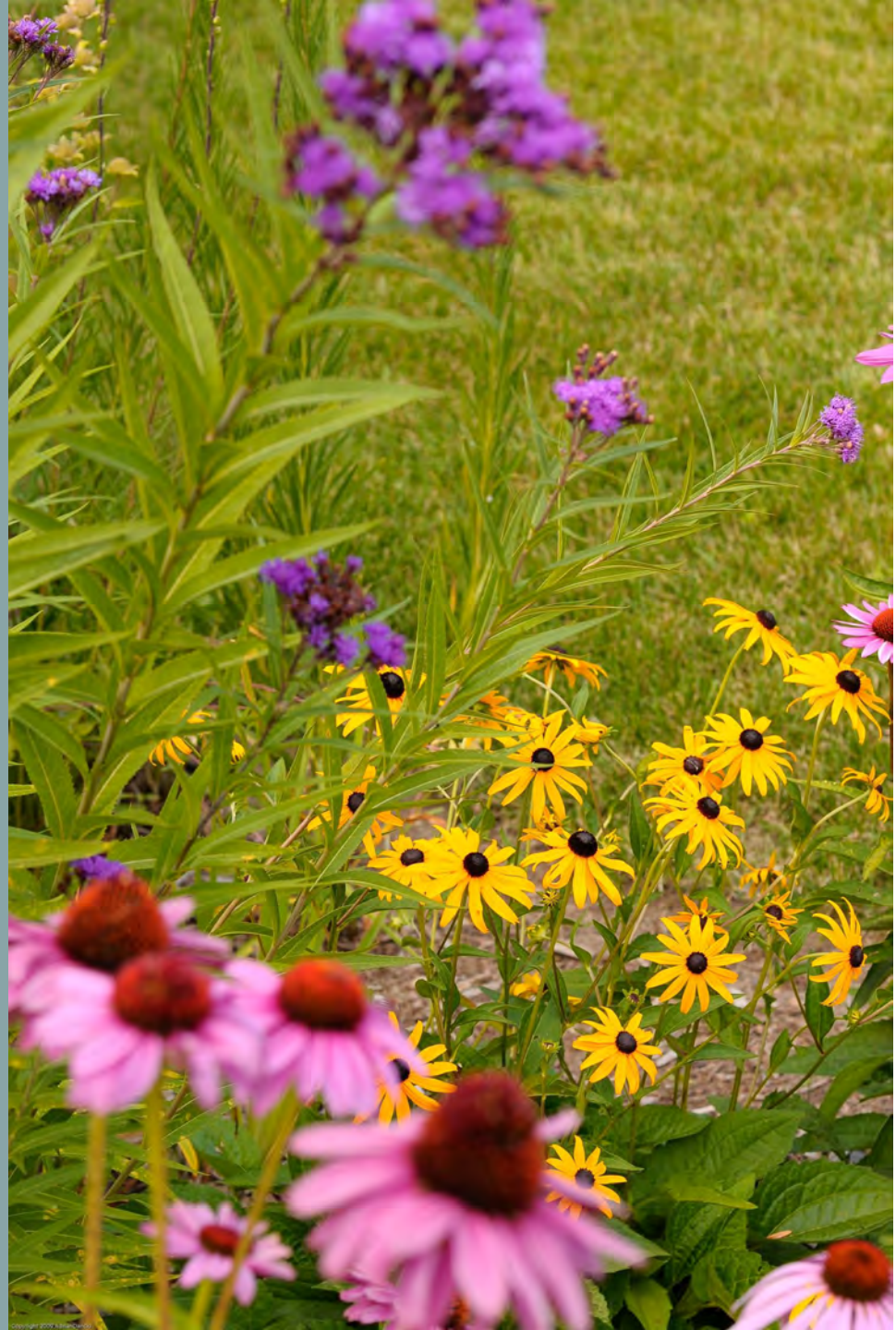
Red maple

Questions related to
raingarden planning or plant
selection?

*Please use the
chat function



Section 4: Installation



Raingardens – Installation Video

- Garden Layout
- Remove Sod
- Dig
- Amend the Soil
- Grade
- Level Basin
- Mulch First
- Plant
- Water & Smile





Herbicide



Sheet Mulching



Solarization



Sod Cutter

Site Preparation:

- **Eliminating Invasive Weeds:**
 - Removal of species such as reed canary grass, crown vetch, or buckthorn take time and persistence
 - Plan for eradication to take an entire growing season
- **Eliminating Turf:**
 - Sod Removal (manual or gas powered)
 - Most landfills & compost sites do NOT take sod
 - Smother (Sheet mulching OR Solarizing)
 - less labor intensive, better for soil health
 - Requires entire growing season
 - Herbicide (Glyphosate based formula)
 - Cheap and cost effective. Be cautious of drift.

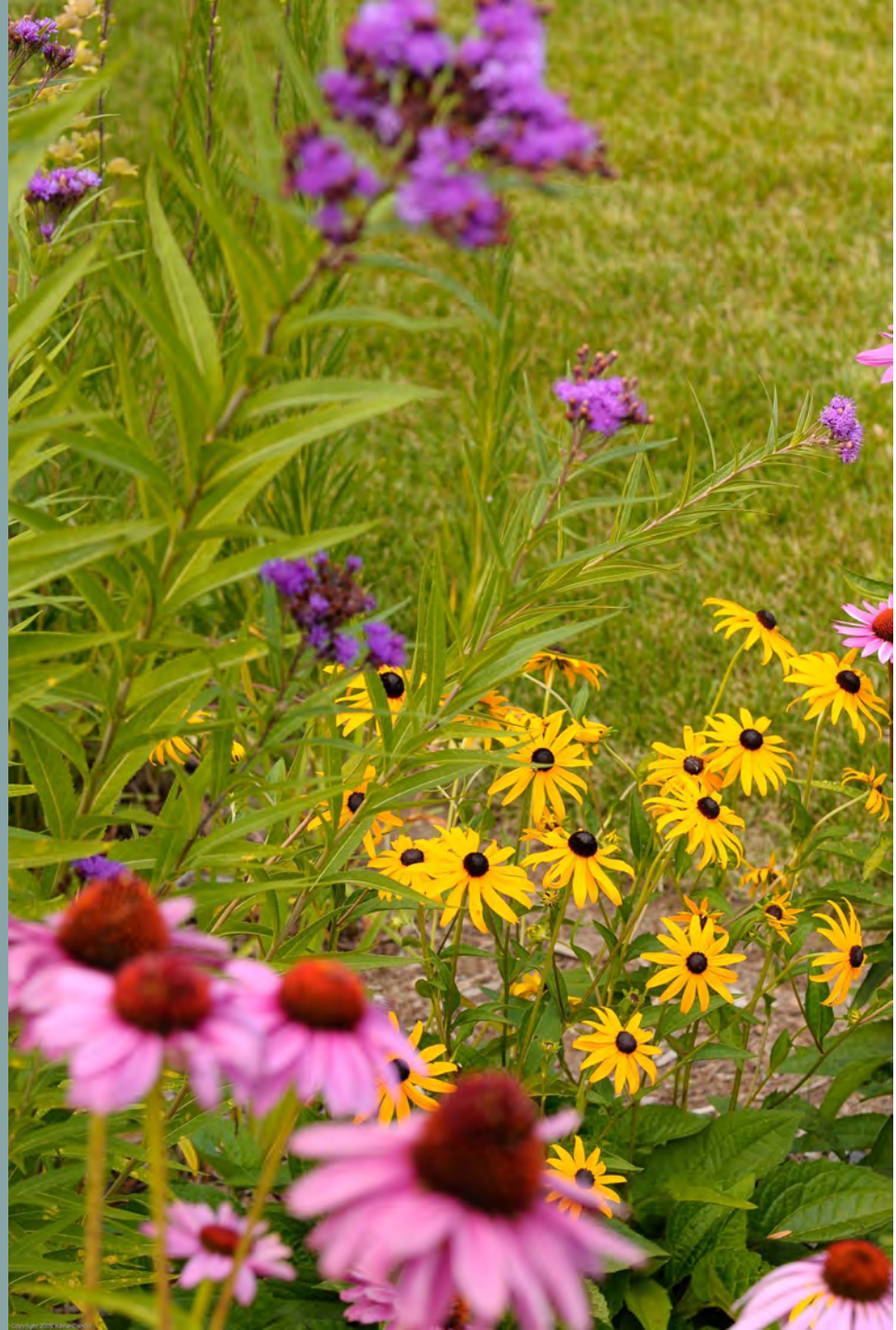
Mulching & Planting Tips

- Always **mulch first** to reduce soil compaction!
- Use double shredded hardwood mulch, aim for 3”
- Avoid the allure of free mulch, they often have invasive species
- Layout your garden before planting to ensure proper spacing
- For most grasses and flowers, space them out 18” apart
 - Shrubs, 3-4” ft
- Avoid mulch volcanoes, don’t build up around the plant



Section 5: Maintenance

*Remember, raingardens are
LOW maintenance, not NO
maintenance



First Year Maintenance

- Water plants regularly, 1” /week
- During large rain events, consider cutting a notch in the berm (lower than the overflow) to prevent saturation of seedlings
- Weed! As the plants grow and fill in, you’ll need to do this less often

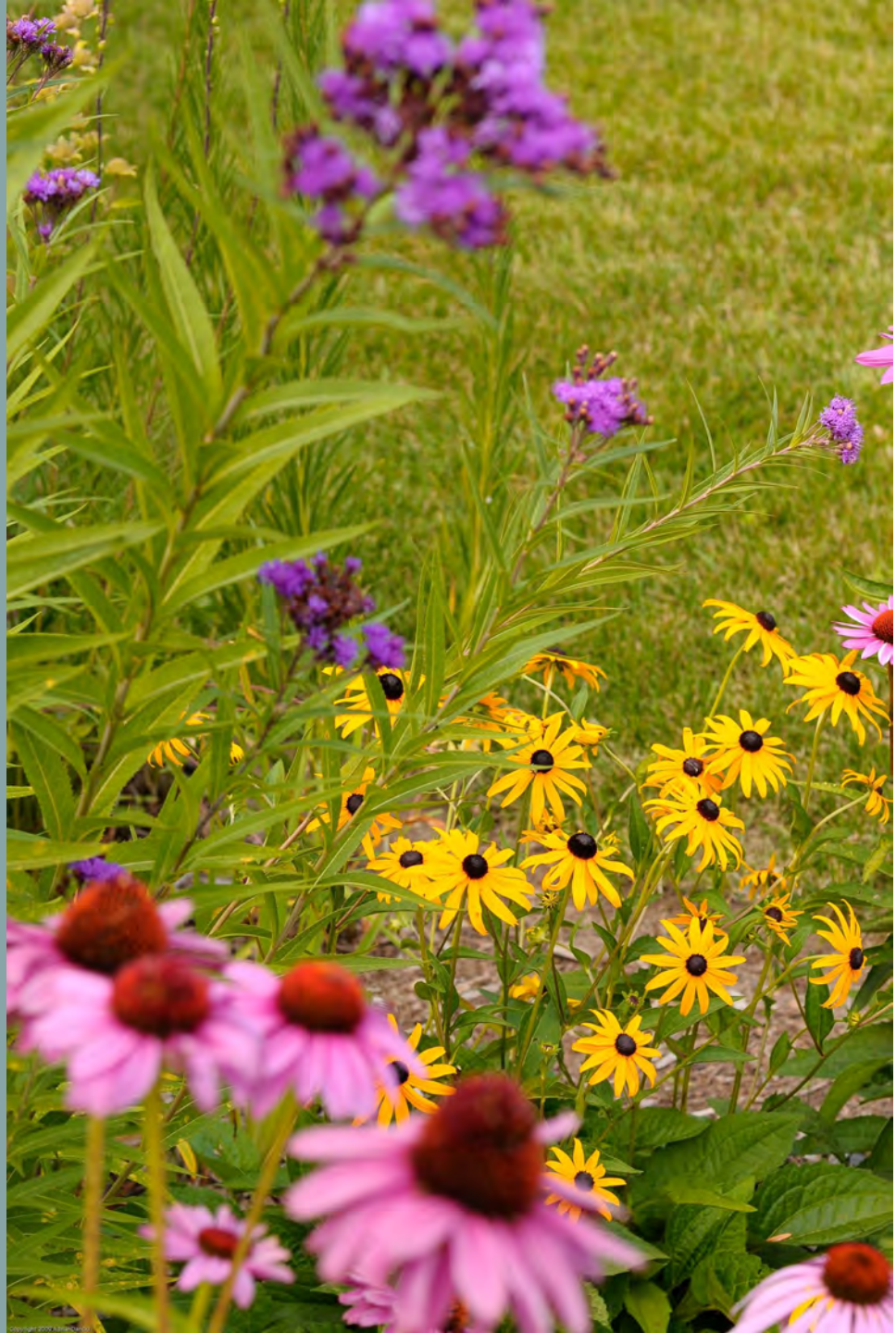


Annual Maintenance

- Maintain 3” of mulch for weed suppression
- Spring pruning. Leave dead material for winter wildlife habitat and food
- Remove or replace plants that are not thriving.
- Sediment removal
- Inlet clean out
- Take photos to track progress!



Section 6:
Technical
Assistance &
Cost Share Grants



2018



2018



Washington Conservation District Raingarden:

- Installed in 2014.
- Cost Share assistance provided by Ramsey Washington Metro Watershed District.
- 1,600 sq ft basin

2014



2016



Designed by WCD



How do I get started?

1. WCD site visits

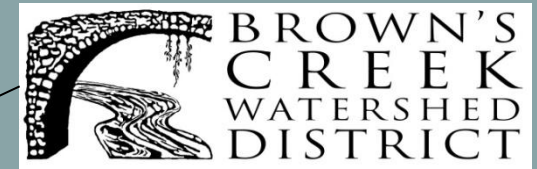
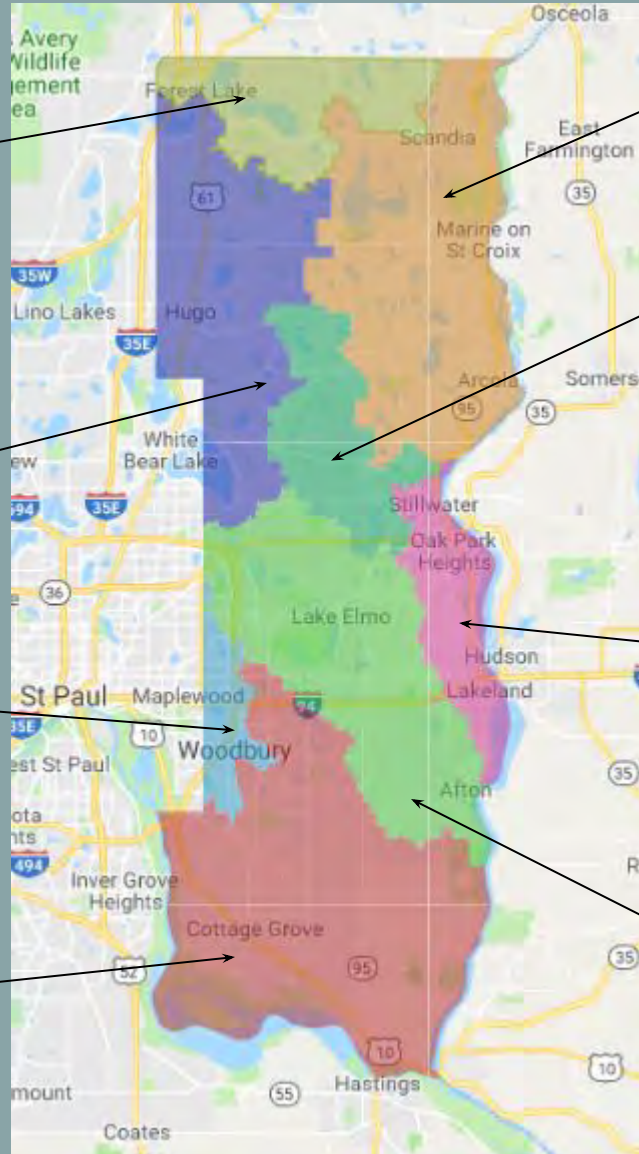
1. Contact your local SWCD to schedule a free site visit and consultation. Visit www.mnwcd.org

2. Watershed District cost-share grants

1. If there is potential for a water quality project, the SWCD staff will provide you information about the cost share programs for your watershed district.



Watershed Management Organizations Washington County



Site Visit



KEY TO FEATURES

Legend

- Parcels
- 2 ft Contours (LIDAR)



VB Valley Branch Watershed District
Incorporated November 24, 1993

Hamerly
9429 Jane Rd N.
Lake Elmo
PIN:1002921240011

2016 Aerial Photo



Concept Example





Questions?

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For more information visit:

Washington Conservation District – www.mnwcd.org

Brown's Creek Watershed District - www.bcwd.org

